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News Bulletin of The Entomological Society of Victoria Inc.

THE ENTOMOLOGICAL SOCIETY OF VICTORIA (Inc)

MEMBERSHIP

Any person with an interest in entomology shall be eligible for Ordinary membership. Members of the Society include professional, amateur and student entomologists, all of whom receive the Society's News Bulletin, the Victorian Entomologist.

OBJECTIVES

The aims of the Society are:

(a) to stimulate the scientific study and discussion of all aspects of entomology,
(b) to gather, disseminate and record knowledge of all identifiable Australian insect species,
(c) to compile a comprehensive list of all Victorian insect species,
(d) to bring together in a congenial but scientific atmosphere all persons interested in entomology.

MEETINGS

The Society's meetings are held at the 'Discovery Centre', Lower Ground Floor, Museum Victoria, Carlton Gardens, Melway reference Map 43 K5 at 8 p.m. on the third Tuesday of even months, with the exception of the December meeting which is held on the second Tuesday. Lectures by guest speakers or members are a feature of many meetings at which there is ample opportunity for informal discussion between members with similar interests. Forums are also conducted by members on their own particular interest so that others may participate in discussions.

SUBSCRIPTIONS

Ordinary Member	$30 (overseas members $32)
Country Member	$26 (Over 100 km from GPO Melbourne)
Student Member	$18
Electronic (only)	$20
Associate Member	$ 7 (No News Bulletin)
Institution	$35 (overseas Institutions $40)

Associate Members, resident at the same address as, and being immediate relatives of an ordinary Member, do not automatically receive the Society's publications but in all other respects rank as ordinary Members.

LIFE MEMBERS: P. Carwardine, Dr. R. Field, D. Holmes, Dr. T. New, Dr. K. Walker, Daniel Dobrosak.

Cover design by Alan Hyman.

Cover photo *Euops* probable *falcata* This photo was taken at Golden Valley Lodge, Flinders on the Mornington Peninsula on 26th Mar 2011 by Joshua Grubb. For the story of this taxon see Rolf Oberprieler's notes on page 1VE 42(1) February 2012.

Notes from the Member's Excursion within the Museum Victoria August 21st 2012

Present: R. Best, D. Carman, P. Carwardine, D. Dobrosak and his son Cale and nephew Jack, B. Goonan, R.Goonan, K Harris, C. McPhee, D. Mules, M. Hewish, G. Kuseff, P. Lillywhite, P. Marriott, K. Walker, G. Weeks. Please let us know if your name was omitted as the list has been lost.

Apologies: L. Rogan, S Curle.

Peter Marriott welcomed all attendees and explained that the evening would involve visits to three areas of the museum. One new member was elected (see p. 87).

Ken Walker presented a demonstration of Bowerbird. This website is in the later stages of development and will provide a way for keen naturalists and the general public to connect with experts and receive help with identification of fauna in Australia. It is described as "A place where you can share and discuss Australia's Biodiversity."

Peter Lillywhite explained the workings of the image stacking process and showed the photos that are obtained with this amazing setup. The museum is using both digital SLR cameras and customised microscope camera systems to produce images with an abnormally deep depth of field. In simple terms, multiple photographs are taken while scrolling through the specimen so that there is an image for every part of the animal with at least something in focus. The software then stitches just the focused parts together. Many nature photographers would love to achieve such depth of focus.

Catriona McPhee took participants on a tour of both the wet collections, consisting of preserved soft bodied animals including arthropods and insects, often larval stages and caterpillars, and the dry collections, including a range of pinned specimens in a wide range of sizes. Of note was one 350 year old butterfly from China. (How did this come to be in the collection?)

Jack (Daniel's nephew) and Cale (Daniel's son) inspect some of the beetles in the dry collection. Photo by Daniel Dobrosak.

The following short report comes from one of the youngest participants in the evening, Daniel Dobrosak's nephew Jack:

When we went to the museum recently, my favourite things there were the pinned bugs because I got to see the bugs, small and big, up close. I also liked the bugs in jars because you could look all around their body. I liked being with other people who like bugs.

I also liked being able to stay up late on a school night with my cousin and uncle.)

Thanks to all who helped organise this evening.

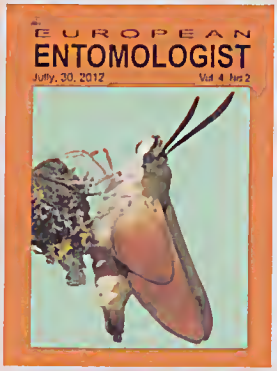
Minutes of the Council Meeting 18 September 2012

Present: P. Marriott, P. Carwardine, S. Curle, L. Rogan, P. Lillywhite.
Apologies: K. Walker, D. Stewart, D. Dobrosak, I. Endersby, M. Fiedel.

Previous minutes
Minutes of the council meeting on 15 May 2012 [Vic. Ent. 42(3): 49] approved.
Minutes of the previous council meeting [Vic. Ent. 42(4)] were notes of the meeting as a quorum was not present. Notes accepted into the records for these minutes.

Correspondence:

Email from the European Entomologist:



The European Entomologist

If You have interest to subscribe journal, then please visit our website
www.sphingidae-museum.com

We've received positive comments from Brent Collins about VicEnt website and he hoped the following link is useful for our members:
http://www.startlocal.com.au/articles/educational_insectcollecting.html

We have received this communication from Chris-Anne Pleasance, who writes to us seeking assistance with identification of a selection of creatures that she has recently discovered at her Dromana residence. Images follow; some we have already identified; if members have information on the others, please feed back to the secretary who can facilitate introductions if need be.

Fig. 1

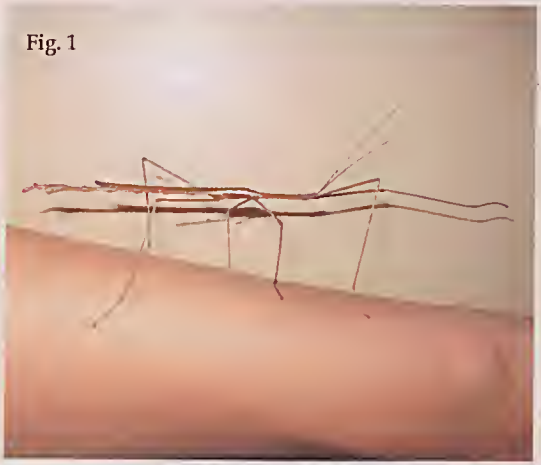


Fig. 2


Fig. 3


Fig. 4


Fig. 5

Fig 1. Unidentified stick insect
Fig.2 Cowboy Beetle *Chondropyga dorsalis*
Fig. 3 *Cochlicella barbara* - native to Europe and a recognised pest species in Australia
Fig. 4 Black House Spider *Badumna insignis*
Fig. 5. Lacewing *Osmylops sejunctus*
Other photos from Chris-Anne were an undetermined spider, Darkling Beetle Tenebrionidae family, what we believe to be a Leopard

Treasurer's Report:

Account Balances
General a/c $6,335
Le Souef a/c $5,623
Publishing a/c $15,843
Unfinancial Members 6

The council discussed an increase in the membership costs to cover the increasing postage costs; council agreed a cost increase to membership fees is not required at this stage.

Editor's report:
Sufficient articles have been received for the October bulletin with some articles over for the future. The editor would like to see more photos included.

Membership Applications:
One new member was elected (see below).

General Business:
Publications
MOV 4: MoV4 is on track for October publication. These publications have been very successful. MOV1 has been sold and a revised edition with 400 copies will be printed at the same time as MOV4 (1000 copies). The second edition will have additional species and information, much of which have been sent out as updates.

Society Bulletin: Discussion entered into regarding the cover price of the publication which directly has an effect on the retail market. Agreed to increase the cover price printed on the bulletin; P. Carwardine to identify target price and liaise with council at next meeting.

P. Marriott moved that, in recognition of the magnificent contribution to the society and as our longest serving Editor for the society, that D. Dobrosak be conferred as a life member of the society; seconded P. Lillywhite.

Future meetings: see page 108. Meeting closed 18:43

Welcome is extended to the following new members whose applications have been received and approved:
Darren Carman from Moe South whose interests include Terrestrial Invertebrates/Taxonomy/Photography
Gary Hearnes from Packenham, Vic. whose interests include Beneficial Insects

History of ENTRECS – Part 2: Annals of the Society continued

Kelvyn L Dunn

Email: kelvyn_dunn@yahoo.com

Preamble – the dawn of change

The first part in this series (Dunn 2012) dealt with the origins of *ENTRECS* and the role its devisor, the late Nigel Quick (1928-2002), played in developing the scheme for the Entomological Society of Victoria during the 1970s. This continuation of the history overviews the course of the project under the initial management of David Crosby and then that of the *ENTRECS* Subcommittee, established soon after. The Subcommittee coordinated the scheme from the early 1980s until its recess – a period of about 25 years. The 1980s saw the first phase of map plotting, but the term (although successful in this aspect) was complicated by administrative issues. It was during this time that Council contended with and eventually resolved the ongoing advisory role of Nigel after his resignation from the Society. Negotiations with one or more other mapping projects, which *ENTRECS* had inspired, then posed further challenges to the Subcommittee as it soldiered ahead to achieve its aims.

3. Emergence of the first adopter

The mantle of digital authority was clearly on Nigel but his driving role as the scheme's innovator and commentator could not be maintained after 1979. The lure of ongoing fieldwork in the tropics now beckoned, and as predicted by theories of change management, it would be the adopter (rather than the innovator) who would sell the project. An announcement, by proxy, in June 1981 of his impending relocation to northern Queensland (11:38) confirmed to Council that the innovator's term of leadership had finally ended.

Whilst presiding over the Society during the scheme's inauguration in the mid-1970s, David Crosby had become enthused with Nigel's vision. It seemed appropriate then for David to step into a new role as the acting spokesperson for *ENTRECS*. He was the 'salesman' that Council needed to promote data centralisation, drive the future outputs and encourage the participants (which included members and interested others) to contribute their personal records. David began with review and coordination of the scheme (11:15) and requested more data, stating that the supply of records had tapered off (Crosby 1979). Following Nigel's earlier lead, to work on butterflies he emphasised that participants should complete their data collation for the Pieridae (11:40), which had not been hitherto forthcoming and had been scheduled for completion three years earlier.

Some 14 months later, in September 1982, David proposed the election of a new coordinator (12:36). He hoped to enlist someone with well-honed computer skills, albeit that this was still a novel discipline at that time, and sought a suitably qualified member to be coopted onto Council (12:36); but no one could be found or volunteered. Instead, Council empowered David to form an advisory board to steer the future data collection under his leadership (12:50; Crosby 1990). He approached three other members of the executive council (the writer of this history was one of them, along with Mark Hunting and Joy Burns) and they met in October 1982 to discuss the aims, role and operation of the group. The Council ratified the creation of the Subcommittee in May 1983, with David as the scheme's convenor (Crosby 1990). The *ENTRECS* Subcommittee aimed "*to examine priorities and feasibility of producing maps for butterfly distributions in Victoria fairly quickly*" (12:50).

The Subcommittee identified two key directives essential to accomplish the task ahead: to encourage participants to extract data from their collections; and to promote exploration, as this was required to enhance the survey coverage of the State. The first directive was in progress already, so attention focussed on the second. The team quickly released a synoptic map of all collected grid-cells, current

to April 1983 (13:14). Mark, who had diligently hand-plotted it, announced at the General Meeting of 15 April 1983 that its purpose was to guide collectors to survey new areas of Victoria (13:21). Manually plotted maps for selected butterflies were soon released to stimulate more interest (Dunn & Hunting 1983, Hunting 1984) and, as the project covered all insect groups (not just butterflies), Joy began the collation of records on beetles. Sample maps of four species of Jewel beetle (Burns 1984) and one Scarab (Faithfull 1986) followed as participation in data extraction increased.

4. Unexpected developments on the role of the innovator and on ownership of the data

As with many honourable endeavours, unforeseen matters can arise, and so the Subcommittee was not immune to an administrative load (associated with access to and custody of the data) nor to interpersonal or social concerns (linked to the gain or loss of roles). The unfolding of events suggests, in retrospect, that Nigel had supposed he could remain as the coordinator of *ENTRECS* without being on Council (given he resided outside Victoria and was, for that reason, unable to attend meetings). Instead, Council had assumed that Nigel did not expect to be involved any longer and that he was supportive of the new directions, from afar in northern Queensland (Hunting p.c. 2012). However, about 20 months after the formation of the *ENTRECS* Subcommittee, Nigel relinquished his honorary life membership (14:43-44) – the award for which he had once felt greatly honoured (Quick 1981), and resigned from the Society in July 1984. The Council minutes at the time did not convey the reasons for Nigel's sudden decision and his correspondence with me was similarly uninformative. Nevertheless, "*it would be fair to say that Nigel's prompting to bring his decision to Council weighed heavily with David as Convenor, because they had collaborated so closely together for the past 15 years*" (Hunting p.c. 2012).

If the Subcommittee had thought that Nigel's resignation was to herald a departure from his further involvement with *ENTRECS*, then it was mistaken. As an independent adviser, Nigel wrote to the Convenor in 1985 proposing his continued involvement concerning copyright, ownership rights and revenue raising from *ENTRECS*. "[I] *Have been giving a lot of thought to those copyright queries, and hope that the following suggestions are not too one-sided for consideration. ... I want, for my part, to help offset my outlays, and for the Society's part, for them to share in any benefits, and distribute as they see fit. I do not see that re-joining* [the Society] *would necessarily or materially alter the situation.*" (Letter to DFC dated 23.viii.85; copies to TRN & KLD). The Subcommittee found itself suddenly dealing with these and other issues, that were raised in the continuing advice from Nigel for several years thereafter, even though he was no longer a member of the Society.

Nigel purchased his own computer in 1985 (the Society was without one), and his continuing interest in *ENTRECS* and the potential financial benefits to the Society were made clearer. He detailed fees applicable to various categorised customers for access to the data. Access to the completed 'Individual Record Sheets' would be free of charge to members and regular contributors (except for computer-generated hardcopies, which required purchase). However, Nigel re-thought this and later retracted free access to the original submissions too, "*This I now realise is inadvisable*" (Letter to KLD dated 18.xi.86), but gave no explanation as to why contributors could not access information they had personally supplied. A minimum extraction fee where algorithms queried or sorted data was specified at "*$65 per hour*"; at that time the average (full-time) wage was about $400 per week (QG 2012). The fees were "*to be shared on an equal basis by the proprietor of the hardware* [WNBQ] *and the Society.*" (Letter to DFC dated 23.viii.85). He offered to digitise data for the Society too (in that way enabling himself, as a non-member, ongoing access to new information received for his private database which he was then developing) as long as any fees applicable to himself be waived (Letter to DFC dated 23.viii.85). This letter to the Convenor does not appear receipted in the minutes, but the Subcommittee at that time considered the matters raised and rejected a fee system (Hunting p.c. 2012). Five years later the Society formally documented its position on the ownership and use of the data (Crosby 1990; 23:67-68; 25:42).

In that same correspondence from 1985, Nigel emphasised three business premises devised to guide *ENTRECS*:

First Premise: The actual data must be available for general scientific purposes. This does not imply that it can be acquired free of cost, any more than that obtained by financing continual regional surveys.

Second Premise: That, in general, any and all data from the data bank is made available without copyrights and subject to acknowledgement where published.

Third Premise: (A) That copyright on the recorded data will belong to the Society, and (B) copyright on the system will belong to W.N.B.Q. (Upper-case font removed, secondary emphasis retained).

Nigel later explained that he "had not intended that the Society would hold *exclusive* copyright on ... contributors' own records" (letter to KLD dated 18.xi.86; emphasis retained), and that he had intended that "some sort of reciprocal copyright" (*op. cit.*) would apply. There were also ambiguities with the system copyright; the new assertion in 1985 conflicted with original documentation on the 'single-species card' (as "Ent Soc Vic NQ 73") and on the 'field card' (as " © NQ Ent. Soc Vic"), both supplied as inserts in the undated *ENTRECS* manual. When read in juxtaposition they implied a copyright (inferentially then of the 'system') to both ESV and Quick, dated 1973 (or possibly 1975; the print of the last digit was blurred). Whether a juxtaposed statement would have met legal requirements at that time, though, is unclear.

The Subcommittee considered that some of these business premises were at odds with its aims regarding the data usage and the proposed administration of the scheme. At a subsequent Council meeting, Mark clarified that *ENTRECS* was a Society endeavour and that Nigel was no longer in a position to set the scheme's agenda. Nigel's involvement did not end there though; instead, a resolve of intrigue began to emerge. He then indicated that he had retained a copy of the *ENTRECS* butterfly data for personal usage (reported by proxy to Council by the Convenor, but not recorded in the minutes). This led to lengthy discussion within the Subcommittee over the ownership of the data. The stakeholders in the data set were identified as the Society (as the administrator, responsible for its storage), Nigel himself (as the original recipient of the data and past geo-coder), and the various contributors (as the extractors and suppliers of data).

Council's main concerns were whether it was ethical for Nigel to have copied the *ENTRECS* holdings without consent, and whether he (or anyone else with access to the copied data) could procure the scheme's plans. The Subcommittee decided that the matters were unresolvable at that time and that Nigel was a legitimate stakeholder due to his pioneering effort, with some entitlement. The Honorary Secretary and the Convenor soon met with Nigel to discuss "*the implementation of various aspects of the scheme*" (15:62), particularly the issues of access to and ownership of the *ENTRECS* data (Hunting p.c. 2012). Fourteen months after Nigel's resignation the minutes of the Council Meeting of 20 September 1985 announced a new partnership: that of David Crosby and Dr Tim New with Nigel Quick. Together they now planned for an interim series of butterfly maps (15:29 & 62) to be completed "*as soon as possible*" (15:15), with the following report stating that they hoped to publish the maps "*within a few months*" (15:77). At that time, the Convenor also informed Council of the possible use of the data in the Victorian National Parks Association review of nature conservation in Victoria (15:62), in order to meet the first premise of data availability.

Protracted discussions over Nigel's continued involvement (whilst not being a member of the Society) and his planned personal use of data (evidently for a book being drafted – letter to KLD dated 17.iv.85, with copy of body text sections for perusal) brought to the surface a second division of opinion among Subcommittee members. The matter concerned "*conflicts of interest with other recording schemes*", as revealed later in the minutes (20:92), which had surfaced as problematic by late 1985. The Dunn and Dunn butterfly distribution and mapping project (see Crosby 1990 for discussion of negotiations) had planned to include Victoria within its broader coverage of the Australian

states and territories, and *prima facie* presented itself as in conflict. The Society was aware that the Dunn and Dunn database had grown substantially between 1983 and 1985; data from several museums had been included by that time and its holdings soon expanded to over 40,000 digitised records (17:93). Council member, Ian Faithfull queried the Subcommittee as to if the Dunns planned to "*hand over all Victorian records on their database*" (rather than just some) as their cooperative endeavour (given that the writer was on the Subcommittee). Assessing then that this seemed unlikely, he aired that, "*It is my view that K. Dunn & L. Dunn have effectively hijacked an ESV project*" (albeit an opinion no longer held today) (personal notes from meeting provided by Faithfull, 2012). Council reported that, "*the ongoing problems* [implying those to do with other insect distribution recording schemes] *were discussed at length*" (15:76).

Another issue, discussed briefly by Council, was that of the writer's continued role in *ENTRECS*, in particular whether that role might enable access to any butterfly information and so add further concerns. David and Mark each held custody of the raw data across the separate periods of leadership during the scheme's history; they alone had access to the butterfly records within the Society. The author's role on the Subcommittee (like that of Joy's at the time) was as an adviser, and the Convenor had duly considered that role useful in the scheme's progress. Yet, in spite of this or perhaps because of it, a mistaken belief (possibly surviving even to this day) arose. That misunderstanding was that the Dunns had actually built their database on the *ENTRECS* raw data through association with the Subcommittee. The Society, however, did not make the *ENTRECS* dataset available to the Dunn and Dunn project (for the atlas set of 1991) and neither did Nigel. (What might appear as an exception was the case of those records from one member who later wished to contribute to both projects. David, acting by proxy, supplied relevant records because that member was then living overseas and was unable to send the same information himself.) Clearly, complexities such as dual involvements can give rise to varied opinions or even negative impressions, but this fuller information at least serves now to clarify that aspect of history.

The Dunn and Dunn project was announced and demonstrated at the General Meeting of 18 February 1983 and the programming achievements in data sorting and information displays "were very well received" (Hunting p.c. 2012). Laurie Dunn (who had studied computing as part of his engineering career) was the project's software designer and, at that time, offered to digitally construct Mercator-style grid-maps to 10-minute resolution (13:11) to assist the *ENTRECS* working-group. The project's separateness, however, was evident by its nationwide scope and differing map formats; the Dunns planned to finely plot records using latitude and longitude rather than fill grid-cells (Crosby 1990: 96). Earlier, in 1981, discussion among some members for change to this methodology had met with resistance from Council. It was "*considered unnecessary*" in relation to the *ENTRECS* scheme's needs (11:50), and later the coarser coverage was justified as a "*practical size to map*" by manual plotting (ESV 1986: 1). This method, underpinned by "*some deficiencies*" in the recording forms (Crosby 1990: 96), unposed "*project limitations*" on the *ENTRECS* scheme over time (Dunn 2009: 76); in reality *ENTRECS* was now wedded to low resolution (10-minute) plotting given the requisites that Nigel had devised.

The new and increasing focus on the Dunn and Dunn project, and perceived conflicts of interest particularly an expectation to surrender personally collated museum extracts of Victorian data for the Society's ownership, led this writer to disengage from the Subcommittee during the mid 1980s, for an extended time. The generous offer of programming assistance from Laurie Dunn (who served on Council between 1983 and 1985, but who was not a member of the Subcommittee) was left in abeyance, as the Society had no hardware to support it.

5. Runs on the board – A long awaited publication

After four years under the directorship of the convenor, the Subcommittee's first major output, *Preliminary distribution maps of Victorian butterflies*, was published and tabled in March 1986 (ESV 1986,

16:16), and advertised for sale soon after (16:17 & 82; 16:28). It was the product of labour intensive, manual plotting by Mark (Crosby 1990) and included all records of this group submitted up to April 1985. The print run comprised 50 copies (T. New p.c. 2012) and, of these, a complimentary one was duly presented to Nigel (16:53-54). This marked the scheme's milestone and affirmed Nigel's earlier role in the achievement and his later assistance as an external adviser. The distribution maps incorporated the rectangular grid, comprising parallel lines of latitude and longitude, and so retained the Mercator projection, a hallmark of the prototype *ENTRECS* maps.

The publication of these 'preliminary' maps of Victoria also served to separate the directions between *ENTRECS* and the proposed outputs from the Dunn and Dunn project. The nationwide project had embarked upon a 10-year data collation phase and, at that time, there had been no plan to publish before 1993 (Dunn & Dunn 2006: 841). Negotiations put in writing (Crosby 1990) smoothed any remaining conflicts of interest that might have arisen between the two separate enterprises (20:92), and the Dunns agreed not to print butterfly distribution maps of Victoria alone (Crosby 1990), as part of their forthcoming atlas set. Enthusiasm was at a high but changes in policies loomed ahead ... and the second adopter would soon bring forth a new charter.

Acknowledgements

The author sincerely thanks Ian Faithfull and Peter Marriott for their provision of helpful comments, frankness in relation to background information, and advice concerning aspects of the scheme's history. Thanks are also due to David Crosby and Drs Tim New and Ross Field for feedback on drafts of this section. Finally, on behalf of the Society, Mark Hunting critically reviewed this section. In doing so, he offered many valuable suggestions, subtle re-wordings, and provided insight into some historical matters, greatly improving the final manuscript.

References

NB: In accordance with Part 1, citations of Minutes of meetings, *ENTRECS* Subcommittee reports, advertisements, editorials, 'On-the-grapevine' contributions and minor announcements in the *Victorian Entomologist* are abbreviated to volume and page and placed in parentheses.

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A call for cooperation - Milkweed Bug (*Arocatus* sp.) urgently needed

Hemipterans of the subfamily Lygaeinae have a predilection for toxic plants. They often feed on plants of the family Apocynaceae which are famous for the production of toxic cardiac glycosides. Some lygaeine species are known to have intricate adaptations to these specific plant toxins. They can not only tolerate these toxins but also store them for their own defense against predators.

We have established a molecular phylogeny of several lygaeine taxa. Moreover we have screened our test species for their molecular and physiological adaptations to cardiac glycosides. Our comparative approach enables us to reconstruct the evolutionary history of cardiac glycoside resistance and usage in this hemipteran subfamily.

For interpretation of our results we urgently need DNA samples of Australian species of the genus *Arocatus* (e.g. *Arocatus rusticus*, see Fig. 1). Adults and nymphs should be found on fruits of Cotton Bush (*Gomphocarpus, Asclepias*) or other apocynaceous plants. For our investigation it is necessary that the specimen is stored in a sufficient volume of pure (undenatured) ethanol. Any help is highly appreciated! We will of course pay shipping costs. Please contact me if you have further questions. Axel Kallies (kallies@wehi.edu.au) has agreed to supply pure ethanol if needed.

Fig. 1: *Arocatus rusticus* adult and nymphs, Photo by Jürgen Deckert

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The brown lacewing, *Micromus tasmaniae* in Tasmania: Part 1

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The first part of this article collates information about brown lacewing, *Micromus tasmaniae* (Walker) (Neuroptera: Hemerobiidae) in Tasmania. (Fig. 6&7 p.101) Francis Walker (1860) originally described it as '*Hemerobius Tasmaniae*' from 'Tasmania'. Records in the Tasmanian Plant Pest Database (TPPD), reflecting mostly specimens held by the Department of Primary Industries Parks, Water and Environment, Tasmania are summarised for locality, season and hosts. Light trap data is offered with the suggestion that frequent migration of brown lacewing from mainland Australia to Tasmania may occur. In the second part of this article the light trap catches are further examined and those for 2004-05 are compared to field observations of brown lacewing for evidence of a relationship.

Integrated pest management in annual crops of south-eastern Australia relies heavily on a few species of generalist predators entering crops soon after pests. Horne *et al.* (2001) show this for brown lacewing (BL). In north-west Tasmania, notable of these predators are the brown lacewing, Pacific damsel bug, *Nabis kinbergii*, transverse ladybird *Coccinella transversalis*, eleven-spotted ladybird, *Coccinella undecimpunctata* and a common hoverfly, *Melangyna* species. Near Hobart, the recently adventive, spotted amber ladybird, *Hippodamia variegata* has shown promise against aphids in commercial lettuce. Other predators of the south-east mainland such as the hoverfly *Simosyrphus* and the red and blue beetle, *Dicranolaius bellulus* are uncommon or absent, respectively while the common spotted ladybird, *Harmonia conformis* is present but not necessarily common in low, annual crops of north-west Tasmania. Although the diversity of generalist predators dominating agricultural field crops across wide areas of Australia is low, they can be very effective in integrated pest management. This is in part because they are widespread and mobile in the landscape, as recognised by New (2002) for BL but the full magnitude of its dispersal is perhaps underestimated.

The TPPD contains 103 records for BL of which 99 are based on specimens including 59 specimens from the Stony Rise light trap, whose catches (Table 1) are discussed below. All specimens except one series of two larvae are adults. The earliest specimen was collected in March 1939 on Flinders Island by then government entomologist, John Evans.

Hosts from which adults, recorded in TPPD, were collected include avocado fruit in a shop, *Baeckea leptocaulis* flowers, celery, sweet cherry, forage turnips, green bean, grape, kangaroo apple (*Solanum laciniatum*), lettuce (both field lettuce and cut lettuce in a shop), green pea, peppermint, potato, sweet corn, tall native heath and wasabi in an urban shadehouse. They have also been regularly observed in broccoli crops.

Localities represented by the specimens recorded in TPPD cover King Island, Flinders Island, south-west (Strathgordon and Mt Lewis, *Baeckea leptocaulis*) and south-east Tasmania including the Hartz Mountains. Absences from the north-east, east, Tamar Valley and Midlands probably reflect lack of collecting effort.

Months for specimens in TPPD that were not trapped by light are January (3), February (7), March (4), July (1), October (1), November (8) and December (2 series). Notable portable light trap catches include Mt Wellington at 1000m elevation on 16 December 1988 and Strathgordon on 9 August 1989.

Sparse rearing data suggests that parasitism by a wasp tentatively identified as *Anacharis zealandica* may be high at times. BL larvae collected from celery at Turners Beach on 14 August 1986 yielded one adult BL and one adult *A. zealandica*. BL larvae collected at Lillico from sweet corn tassels on 3 February 1989 yielded one adult BL and three adult *A. zealandica*. A single larva collected at Moriarty from sweet corn silks on 9 February 1989 yielded an adult BL. Three late instar larvae collected at Moriarty from sweet corn ears on 13 February 1989 yielded one adult BL and one adult *A. zealandica*.

Larvae have been observed in annual field crops in all months except September. During a demonstration of integrated pest management against the recently adventive (February, 2004) currant lettuce aphid, *Nasonovia ribisnigri* (Mosley), larvae of BL were recorded from late October to May in nine sequentially overlapping, contiguous, iceberg lettuce crops at Forthside, north-west Tasmania, spanning 23 September 2004 to 10 May 2005 (Hill *et al.* 2006). Similarly, larvae were recorded from December to late July in sequential, contiguous, open-heart lettuce crops spanning 4 November 2005 to 20 July 2006 at Richmond, south-east Tasmania (Hill and Young, 2006). They were also observed in a commercial, celery crop at Turners Beach, north-west Tasmania in August 1986 (TPPD).

Simulated development based on threshold temperatures (egg 4.8°C, larva 5.7°C and pupa 6.0°C) and day-degree requirements (egg 99 DD, larva 112 DD and pupa 159 DD) from Syrett and Penman (1981) suggests 5 generations a year are feasible at Forthside near Devonport where maximum and minimum temperatures are constrained by maritime influences (starting 1 September: 85, 51, 42, 49 and 119 days ending 7 August) and at least six near Launceston (starting 1 September: 71, 44, 36, 36 48 and 118 days ending 17 August). Temperatures at Hobart also facilitate six generations, starting 1 September and ending 21 August. For Forthside the durations for generations initiated on the first day of each month, commencing with the longest are June 140 (133, 97), July 124 (116, 88), August 104 (92, 72), September 85 (74, 60), October 69 (59, 49), November 57 (50, 40), December 49 (40, 35), January 43 (35, 33), February 42 (34, 31), March 53 (48, 36), April 99 (48, 53) and May 139 (135, 87) days. These are on average 22% and 46% longer than comparable simulations for the Victorian localities, Ararat and Laverton, respectively given in parentheses.

Szentkirályi (1997) indicated that 'brown lacewings are night-active insects with strong positive phototaxis, therefore light trapping is one of the best collecting methods to monitor the seasonal activity of adults'. A 160W mercury vapour light trap of Rothamsted pattern operated at Stony Rise near Devonport in north-western Tasmania (41°11'28.83"S 146°19'23.92"E). The trap environment is mostly mown lawn and low buildings but a hedge of tall native shrubs (*Eucalyptus, Acacia, Melaleuca, Leptospermum*) occurs 10m to the north, so that the trap is often in its turbulent lee. It is 1.5m above ground at 60m above sea level, 5km south of Bass Strait and operated nightly from 1992 to 2006 excluding January-July in 1996 and 1998. Data for 12 complete years is summarised in weekly format because the trap was manually serviced at irregular intervals of one to several days.

The catch data for BL are presented in Table 1 and summarised in Figure 1. The sustained summer-autumn activity indicated by the light trap near Devonport, Tasmania (Fig. 2) is quite different to that indicated by a suction trap in Melbourne, Victoria for 1972-74 as reported by New (1984) and by water and windvane traps in Victorian crops as summarised by Horne et al. (2001). For the periods July-December of 1996 and 1998 the catches were 9 and 59 respectively including 22 in the week 10-16 December 1998. Other small, brown lacewings trapped included 30 *Drepanacra binocula*, 7 *Sisyra* sp. (Sisyridae), 4 *Megalomima berthoides* and 3 *Psychobiella sordida*.

BL was trapped in 311 of 624 weeks which is comparable to diamondback moth at 313 weeks although the latter occurred without coincident BL in 101 weeks. One to nine of 54 putative migrant taxa (as listed by Hill, 2011a but excluding *Pantydia* species) were trapped in 90% of 624 weeks. BL occurred unaccompanied by any of them in only eight weeks, which were mostly winter weeks as indicated by shaded cells in Table 1. Mean sea level analysis charts were not available from the Bureau of Meteorology website for the two 1994 and 1999 weeks but for the other six weeks the charts indicate favourable airflows for immigration immediately preceding the particular catch intervals (1 -2 days) in all but one instance, namely 2-3 June 2005, which preceded capture of the regular migrant, southern armyworm 1-2 days later. Some finer temporal analysis to indicate the possibility of immigration is presented below for five large catches in 2002 and 2003 (underlined in Table 1). For 2000-06, data was available for Pacific damsel bug. It was trapped in 84 of the 364 weeks and did not coincide with BL (present 168 weeks) in only 10 weeks.

Table 1. Number of brown lacewing specimens caught in Stony Rise light trap, summarised by week. Shaded cells are catches not coincident with putative or known migrants of which the asterisked catch occurred in airflows unsuitable for immigration. Underlined catches are expounded in the text.

Week	1993	1994	1995	1997	1999	2000	2001	2002	2003	2004	2005	2006	mean
1-7 January	0	2	5	1	0	0	13	0	2	5	2	6	3.0
8-14 January	0	1	2	5	5	0	2	4	2	0	2	8	2.5
15-21 January	0	0	1	5	8	9	2	5	3	3	5	4	3.7
22-28 January	0	1	4	5	4	2	7	1	3	8	5	16	4.6
29 Jan - 4 Feb	0	1	32	8	1	40	6	1	1	6	6	8	9.2
5-11 February	0	0	5	6	6	7	5	1	14	11	13	3	5.9
12-18 Feb.	0	1	1	5	2	5	0	7	1	2	1	3	2.3
19-25 Feb.	0	2	1	2	6	1	11	2	2	9	4	18	4.8
26 Feb-4 Mar	0	2	2	2	2	7	5	5	0	3	2	11	3.5
5-11 March	0	4	5	3	2	25	4	1	0	3	0	6	4.4
12-18 March	0	2	3	3	0	18	1	11	0	2	2	6	4.0
19-25 March	0	0	0	3	2	0	4	4	0	1	5	3	1.8
26 Mar-1 Apr	0	0	0	1	0	3	1	1	8	1	2	0	1.4
2-8 April	0	0	0	0	0	0	0	1	0	0	2	0	0.3
9-15 April	0	2	0	0	0	0	0	6	0	0	0	0	0.7
16-22 April	0	2	0	0	4	0	1	4	0	2	0	1	1.1
23-29 April	0	0	0	0	0	0	0	0	0	4	0	2	0.5
30 Apr-6 May	0	0	0	2	0	1	1	0	0	0	1	2	0.6
7-13 May	0	0	0	1	0	1	0	0	0	0	1	0	0.3
14-20 May	0	0	0	0	2	0	0	0	0	0	0	0	0.2
21-27 May	0	0	2	0	0	0	0	1	0	3	0	1	0.6
28 May-3 Jun	0	2	0	0	3	0	0	1	0	0	1*	0	0.6
4-10 June	0	0	0	0	2	0	0	0	0	0	0	0	0.2
11-17 June	5	0	0	3	0	0	0	0	0	0	0	0	0.7
18-24 June	0	0	0	0	2	0	0	0	0	0	0	0	0.2
25 Jun - 1 Jul	0	0	0	0	0	0	0	0	1	1	0	0	0.2
2-8 July	0	0	1	0	3	3	0	0	0	0	0	0	0.6
9-15 July	2	0	0	0	1	0	1	0	0	0	0	0	0.3
16-22 July	0	0	0	0	2	0	0	0	0	0	0	1	0.3
23-29 July	3	0	0	0	0	0	0	0	1	1	0	0	0.4
30 Jul - 5 Aug	0	0	0	0	0	1	0	0	0	0	0	0	0.1

6-12 August	3	0	0	0	0	0	0	0	0	0	0	1	0.3
13-19 August	2	0	0	0	2	0	0	0	0	0	1	1	0.5
20-26 August	4	0	0	0	0	2	0	0	0	0	0	0	0.5
27 Aug-2 Sep	0	3	0	0	1	0	0	0	0	1	1	0	0.5
3-9 Sep.	0	0	0	0	1	0	0	0	0	0	0	0	0.1
10-16 Sep.	0	1	3	0	3	1	0	0	0	0	0	0	0.6
17-23 Sep.	0	0	1	1	0	1	1	0	0	1	0	4	0.8
24-30 Sep.	2	0	0	0	1	1	1	0	0	2	0	1	0.7
1-7 October	0	0	1	0	0	0	1	0	0	1	5	1	0.7
8-14 October	0	0	2	2	2	0	1	1	0	2	2	4	1.3
15-21 October	0	0	0	0	0	2	0	0	0	1	0	2	0.4
22-28 October	0	0	0	2	1	1	5	0	0	1	0	3	1.1
29 Oct-4 Nov	1	3	0	1	0	0	1	0	0	1	9	3	1.6
5-11 Nov.	0	0	0	3	1	0	2	0	1	2	1	2	1.0
12-18 Nov.	10	0	1	0	8	1	4	1	3	0	1	3	2.8
19-25 Nov.	0	10	0	7	3	7	1	2	2	2	0	11	3.7
26 Nov-2 Dec	0	5	3	17	2	6	1	6	3	1	2	6	4.4
3-9 December	2	10	6	0	39	3	0	3	2	2	5	5	6.4
10-16 Dec.	0	6	2	1	16	3	0	0	3	11	0	6	4.0
17-23 Dec.	1	3	3	8	0	27	2	0	6	8	2	5	5.4
24-31 Dec.	2	1	1	2	1	2	1	5	5	0	2	1	2.0
Annual sum	37	65	86	97	136	181	85	74	63	101	85	159	

Figure 1. Average weekly proportion of annual catch of brown lacewing over 12 years in Stony Rise light trap, near Devonport, north-west Tasmania.

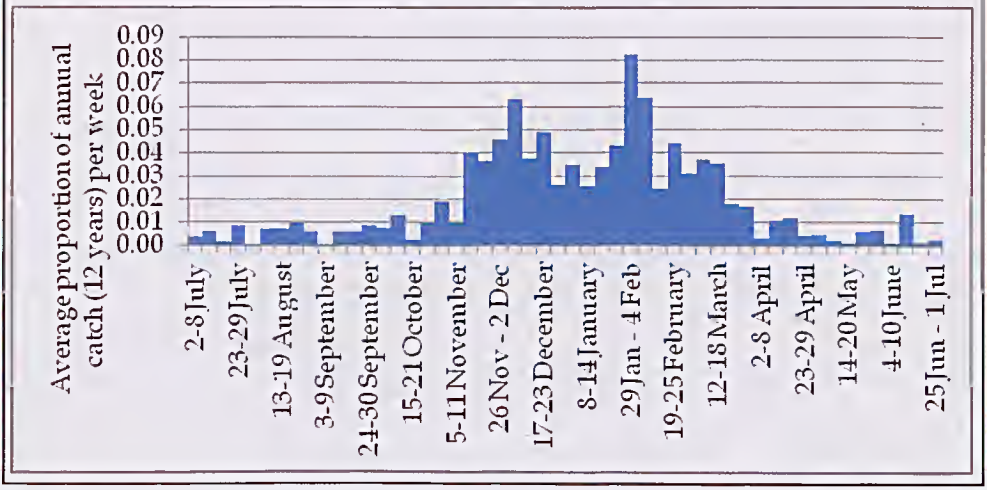


Figure 2. Daily suction trap catch of brown lacewing (1972-74) in Melbourne (New, 1984) (red) and monthly light trap catches for Stony Rise, 1993-2006 (blue).

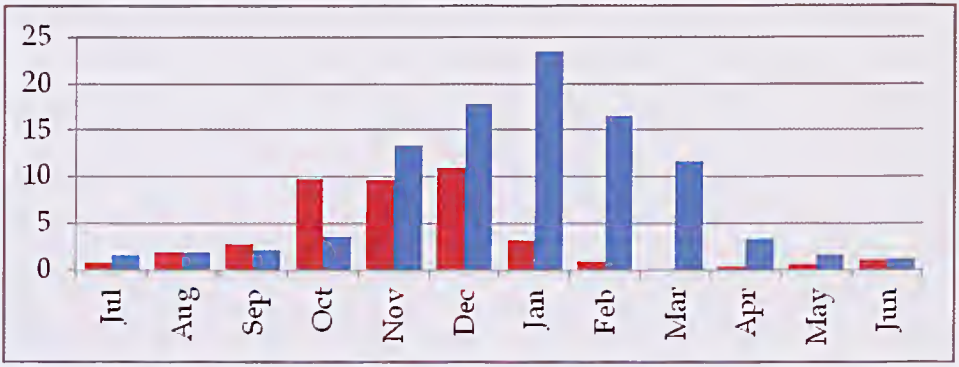
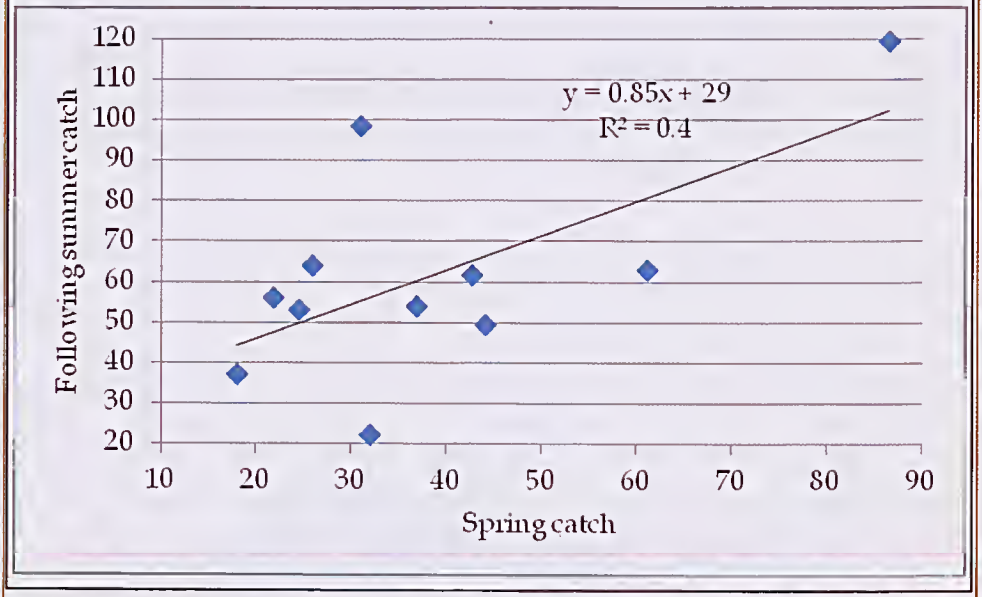


Figure 3. Regression of average January-June catch on that of preceding July-December for 11 years in Stony Rise light trap.



There is a weak correlation between the 'summer' catch (Jan-June) and that of the preceding 'spring' (July-December) as in Figure 3 but none for 'spring' catch against the preceding 'summer'. Correlations of annual catch to annual rain (same or preceding year), annual catch to annual minimum temperature (same year), spring catch (September-December) to preceding summer (January-March) rain and spring catch to preceding winter (May-August) mean (8.7-10.2°C) or minimum (4.5 -6.3°C) temperatures were very low.

Airflows and coincidental catches for five large BL catches

The five largest catches in 2000 and 2001, underlined in Table 1, are described in more detail below to show that they coincided with substantial catches of migratory moths and airflows suitable for

immigration from the mainland. Weaknesses of such analysis are that migratory moths are caught so frequently that coincidence with BL is likely and that airflows favouring immigration bring warm air from the mainland that is also favourable to nocturnal activity of local species. There is a rapid alternation of warm northerly and cold southerly airflows at the trap site.

Figure 4. 3 February 2000, 4AM EST, back trajectory of airflow at end points 50, 100 and 300m above ground level for 24 hours with 6-hourly intervals marked (circles mark 50m flow). Lower air flows level.

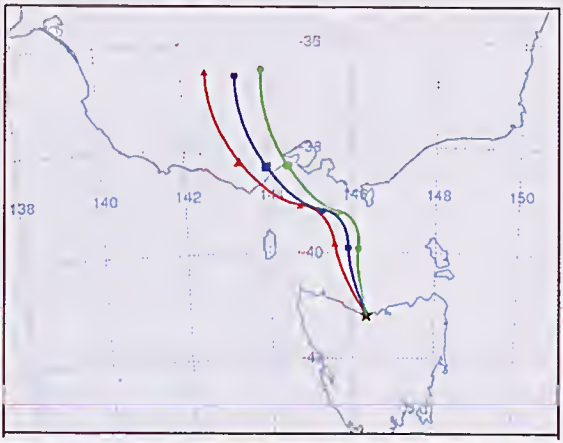
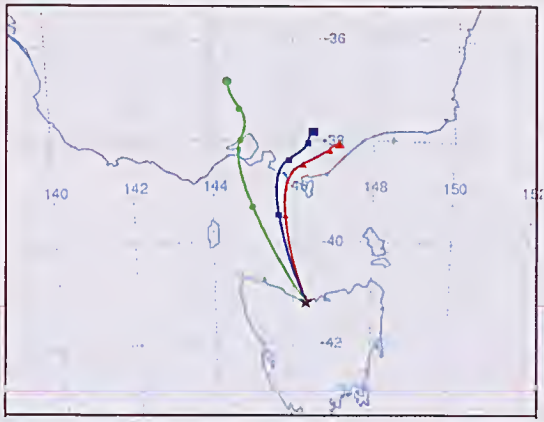


Figure 5. 11 February 2000, 10AM EST, back trajectory of airflow at end points 50, 100 and 300m above ground level for 24 hours with 6-hourly intervals marked (triangles mark 50m flow). Lower air flows level.



29 January – 4 February 2000: The catch of 40 BL in this week (Table 1) occurred in one 2-night interval, 3-4 February. Hill (2011b) outlined the cyclonic conditions in north-west Australia around this period. Coincidental species in this catch included many likely migrants and vagrant moths, namely 2 *Chrysodeixis argentifera*, 3 *Athetis tenuis*, 1 *Agrotis infusa*, 3 *Helicoverpa punctigera*, 4 *Plutella xylostella*, 1 *Utetheisa pulchelloides*, 1 *Hippotion scrofa* and dozens of the lygaeid bug, *Nysius vinitor*. This catch occurred in a north-westerly airflow (Fig. 4). It was followed by five nights of nil or single catches during which airflow backed to the west until 10-13 February when another 7 BL were caught in the next north-westerly airflow (Fig. 5).

5-11 March 2000: The catch of 25 BL in this week and 18 in the following week (Table 1) occurred in three periods, 4-7 March (17BL), 8-9 March (5BL) and again 11-13 March (20BL). Hill (2011b) mentions the influence of tropical cyclone Steve at this time and lists notable immigrants. Suitable airflows for the 4-7 March catch to be of migratory origin occurred on 5 March and a complex series of events including suitable airflows occurred during the 11-13 March catch.

17-23 December 2000: The catch of 27 BL in this week (Table 1) was recorded in five catch intervals, namely 16-18 December (3BL), 19 December (5BL), 20 December (2BL), 21 December (11BL), 22 December (7BL) with nil in 23-24 December. The coincidental catch (mostly 21-22 December) included the migrants 1 *C. argentifera*, 14 *H. punctigera*, 1 *Australothis rubresceus*, 1 *Crioa hades*, 8 *Hellula hydralis*, 128 *P. xylostella*, 1 *U. pulchelloides* as well as 16 Pacific damsel bugs. The first interval coincided with a trough and cold front crossing at 30 knots while a high pressure system sat in the Tasman Sea generating strong northerly winds across New South Wales. In addition a 1006Mb low sat near Port Hedland, a 1004 Mb low near Mt Isa so that heavy rain and strong winds developed in many parts of Australia. The first catch was followed by a brief westerly airflow during which the second catch occurred after which the wind returned to the north-west and then north during the last two catch intervals. After this the catches declined for a week, with only 1 BL caught (25-26 December), as south-westerly gales crossed Tasmania.

1-7 January 2001: The catch of 13 BL in this week (Table 1) was recorded in three trapping intervals, namely 29 December 2000 – 1 January 2001 (2), 2-3 January (4) and 4 January (8). In this period low pressure centres occurred near Port Hedland and the Nullabor Plain as a high pressure system crossed Tasmania and paused in the Tasman Sea while a cold front slipped south of Tasmania. Strong northerly winds occurred across south-east Australia with heavy rain in Victoria, Tasmania and subsequently many other parts of Australia. A considerable number of migrants and vagrant moths were trapped in this period including *C. argentifera*, *A. tenuis*, *Agrotis ipsilon*, *A. infusa*, *A. munda*, *P. xylostella*, *U. pulchelloides*, *Crioa hades*, *Diatenes gerula* as well as the Pacific damsel bug.

19-25 February 2001: The catch of 11 BL in this week (Table 1) was recorded in three trapping intervals, namely 22 February (6), 23 February (2) and 24-26 February (4). They overlapped with very unusual catches of 135 black field crickets, *Teleogryllus commodus* on 20 February, 39 on 21 February and 2 on 22 February. The influence of tropical cyclone Vincent and coincident migrants and vagrants were outlined by Hill (2011a). The BL catches were closely associated with the passage of two high pressure systems followed by cold fronts.

Conclusion

Although BL clearly breeds in Tasmania, large light trap catches of BL coincide with the arrival of known migrants and warm airflows favourable for migration. If these catches indicate long distance migratory flights rather than local dispersal then such migration does not show the early spring peak typical of the pestiferous Noctuidae such as southern armyworm, brown cutworm, common cutworm and native budworm (Hill, 2011a). In the second and concluding part of this article the pattern of light trap catches will be further examined and related to detailed field observations showing the efficacy of BL as a predator of aphids in lettuce crops.

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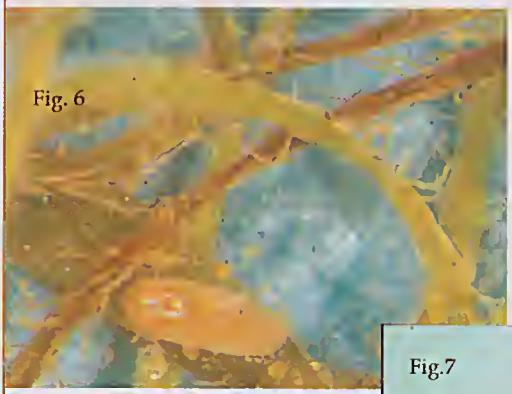
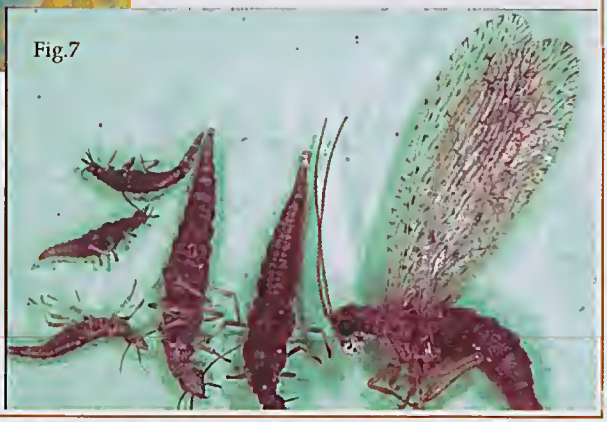


Figure 6. *Micromus tasmaniae* egg on corn silk.

Figure 7. *Micromus tasmaniae* adult and 5 instar stages.



The Bendigo Field Naturalist Club would like to thank the Victorian Entomological Society members Marilyn Hewish, Dean Hewish, Steve Williams and Ken Harris for their wonderful presentation and light trapping demonstration at the recent South East Australian Field Naturalist Association conference. We would also like to thank Peter Marriot for helping to facilitate this. More than 100 participants thoroughly enjoyed the evening with the feedback received being very positive. Ben Goonan

Butterflies of the Wingan Inlet area, Croajingolong National Park, East Gippsland, Victoria, including a January 2012 list

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Abstract
A list of butterfly species observed in the Wingan Inlet area by the first author from 7 to 14 January 2012 is presented along with a tabulation of butterfly species observed in the area by others, a total of 21 taxa, approximately 20% of the East Gippsland regional fauna. *Pieris rapae* is recorded breeding on the exotic succulent beach dune plant *Cakile edentula*. New locality records are provided for two rare species in Victoria, *Delias nigrina* and *Heteronympha mirifica*, the most southerly Australian occurrences of these species. *Theclinesthes sulpitius* is reported from the area for the first time since 1946, probably from close to the site at which it was first recorded in Victoria.

Introduction

Wingan Inlet is an estuary of the Wingan River in Croajingolong National Park, East Gippsland, Victoria. It is a remote area by Victorian standards, surrounded by forest, untouched by agricultural development and inhabited only by temporary campers. Mallacoota Inlet is about 32 km to the north-east, Point Hicks about 21 km to the west, and the town of Cann River about 36 km to the north-west. The usual access involves a long drive from the Princes Highway via the unsealed West Wingan Road, through woodland and native forest. The road ends at a camping ground and a small jetty on the western shore of the Inlet. The first author visited the area from 7 to 14 January 2012 and the majority of the observations reported below are his. The weather was mostly rather cool with rain on a number of days. A collecting permit was not held and specimens could not be collected.

Observations

Adult *Pieris rapae* (L.) were very common along the ocean beach of Fly Cove, 700-1200 m west of the Wingan Inlet entrance on 9 January where they were observed flying around and feeding at the flowers of *Cakile* (sea rocket) growing on the seaward side of the foredune and feeding at flowers of *Senecio*. Their abundance in this near-pristine setting, remote from settlements and agricultural land, was unexpected. The usual weedy Brassicaceae species, on which the larvae normally feed, were not present. On returning to the beach on 12 January, *P. rapae* eggs and early and late instar larvae were found on American sea rocket, *Cakile edentula* (Bigelow) Hook. (Brassicaceae), a succulent herb native to North America, growing on the foredune. Many plants appeared to have been subject to larval feeding. The very similar sea rocket *Cakile maritima* Scop. also occurs commonly along the coast of East Gippsland (Entwisle 1996), but the investigations undertaken were not thorough enough to rule out its presence and possible simultaneous utilisation by the butterfly at this site.

A single *Danaus plexippus* (L.) was seen flying north above the foredunes along the Fly Cove ocean beach on 9 January, c. 1.4 km SW of the Inlet entrance and 100 m north of the start of Petrel Point Walking Track.

Samphire blues *Theclinesthes sulpitius* (Miskin) were common in a patch of coastal *Juncus* marsh on the shore of the inlet c. 150-300 m south of the jetty on 8 January. The probable food plant, a *Sarcocornia* sp., was scarce on the landward side of the rushes. Adults were observed feeding at flowers of *Wilsonia* sp. (Convolvulaceae), growing amongst the rushes, and boobialla *Myoporum insulare* R.Br. (Myoporaceae), on the landward side of the marsh.

A single female *Delias nigrina* (Fabricius) was seen on 11 January, flying around a tall *Pittosporum undulatum* Vent. tree, 20 m west of Wingan Inlet jetty. Suitable food plants exist nearby, namely *Muelleria eucalyptoides* (Sieber ex Schult. & Schult. f.) Tiegh seen abundantly festooning a *Melaleuca*

armillaris (Sol. ex Gaertn.) Sm. (a previously unrecorded host for this mistletoe according to Downey (1998)) growing at the edge of the Inlet. Of the other known food plants of *D. nigrina* (Braby 2000) only *Dendrophthoe vitellina* (F. Muell.) Tiegh. and *Muellerina celastroides* (Sieber ex Schult. & Schult. F.) Tiegh. have been recorded in the wider area around Wingan Inlet (Jeanes 1999).

Paralucia aurifera (Blanchard) adults were seen on 13 January in the Wingan River gorge in the Rapids area, immediately to the north of the northern extremity of Wingan Inlet. A narrow belt of *Pittosporum undulatum* rainforest fringes the gorge. Individuals basked on granite boulders in full sun. An unidentified, dark-coloured, medium-sized *Ogyris*, lacking any large patch of pale colouration on the forewing, was also seen in the gorge.

A single female of *Heteronympha mirifica* (Butler) was observed on 13 January on a ridge in old growth forest of southern blue gum *Eucalyptus globulus* Labill. subsp. *pseudoglobulus* (Naudin ex Maiden) J.B. Kirkp. along the Rapids Walking Track, c. 1 km from Boundary Track, c. 700 m W of Wingan River and c. 600 m WNW of the northern end of Wingan Inlet. It was disturbed in mid-late afternoon along the track where it had been settled in an area of heavy shade with few sunny spots, and flew about 30 m along the track edge before returning to near the point at which it was originally flushed.

The localities where these and additional taxa were observed are recorded in Table 1. Records of butterfly species at Wingan Inlet by other observers are provided in Table 2. Twenty one taxa have now been recorded from the area.

Discussion

Cakile edentula appears to be a previously unrecorded food plant for *Pieris rapae* in Australia (Braby 2000, 2012). However, Powell (2011) listed it as a host without providing any specific locality or date, while Grund (2002) listed it as a food plant, although it is not clear if this refers to Australian records. It is a known food plant of *P. rapae* in North America (Scott 1992) including Canada (Payne and Maun 1984) and probably the USA (Graves and Shapiro 2003), as is *Cakile maritima* Scop. (Maun *et al.* 1990). In addition, *C. maritima* was reported recently as a host at Thurra River, Croajingolong National Park (Braby 2012). *C. edentula*, like all the other recorded Australian hosts, is an exotic species. *Pieris rapae* should probably be viewed as a beneficial species in conservation reserves as to date it appears not to attack native plants. The distribution map for *P. rapae* in Dunn and Dunn (1991) showed no records of the species from the coastline of East Gippsland or southern NSW. Yet numerous records exist inland from the coast, especially close to settlements. Current distribution data (Dunn and Dunn database) has very few records along the coastal shoreline from Wilsons Promontory, Vic. to Eden, NSW; notably Loch Sport, Mallacoota and Lakes Entrance Vic., and near Wonboyn Lake, NSW. It was not seen at Wingan Inlet by the second author, despite suitable weather, during a two-hour visit in mid-afternoon on 29 January 2008 and there appear to be no earlier records of it from the area (Dunn and Dunn database), suggesting that the breeding population may have established only recently. It is evidently now well established there, having been subsequently reported by L. Rogan as common along the beach on 4 February 2012. The wide distributions of *C. edentula* and the very similar *C. maritima* on oceanic shoreline sand dunes in these regions (Entwisle 1996, Retter and Harden 2000) suggest that *P. rapae* potentially occurs and breeds along ocean beaches from the Gippsland Lakes to the Illawarra. It is noteworthy that both these *Cakile* species are succulents and that this does not prevent their exploitation by this butterfly.

Delias nigrina has been rarely observed in Victoria, and only in far East Gippsland, which is the terminal region of the species' range along the coast of eastern Australia. Burns (1960) first recorded the species, based on specimens collected in January and February by Archie May, an apiarist and butterfly collector who lived at Noorinbee North, north of the town of Cann River. According to Burns (1960 p. 128) the specimens, "by their good condition ... had obviously bred in the area". Burns (*loc. cit.*) gave the locality as "near Cann River", as did Braby (2000), although Burns (1962 p.

333) had provided a more exact locality, "Noorinbee North, near Cann River". Mr May, however, was notorious for not labelling his specimens (Dunn & Dunn 2006), so there could be some uncertainty about exactly where these *D. nigrina* were procured. At least one of the specimens, now in the Museum of Victoria, is labelled 'Noorinbee', the label written by Burns (see Dunn and Dunn 2006 pp.66-67, 842). In writing in 1985, Mr May had stated to K.L. Dunn that "most of the interesting records" that Burns referred to in his 1960s papers were collected at his Buddleia bushes ... adjacent to the house" (Dunn and Dunn 2006 pp.66-67, 842) at Noorinbee North. The house and other buildings were located close to Log Bridge Creek (Dunn and Dunn 2006 pp.67, 842), at 37° 26.04' S, 149° 12.1' E, c. 15 km north of the town of Cann River, just east of the Cann River and the Cann Valley (Monaro) Highway, c. 300 m SE of the West Cann Road intersection, and south west of Archie Hill (named after Mr May).

Crosby (1975) recorded *D. harpalyce* (Donovan) but not *D. nigrina* in his surveys of Mallacoota National Park. Dunn and Dunn (1991) recorded *D. nigrina* from Mallacoota (K.L. Dunn collection at ANIC, M.M. Hunting collection). Specimens of *D. nigrina* are on record from Gipsy Point (K.L. Dunn), Genoa Peak (M.M. Hunting and D. F. Crosby) and about Mallacoota (K.L. Dunn, D.F. Crosby, M.M. Hunting) (Dunn and Dunn database). Dunn and Dunn (2006) called for further data to confirm "near Cann River" as the most western record in Victoria. The Wingan Inlet record is approximately half way between Mallacoota Inlet and Noorinbee North, but is the southernmost Victorian locality.

Heteronympha mirifica has previously been known in Victoria only from Mallacoota (Dunn & Dunn 1991, 2006, Braby 2000), more precisely the western side of Mallacoota Inlet. Historically, it was first recorded in the Mallacoota area by A.D. Bishop (1971) who collected a "fresh female ... near Mallacoota in late January, 1971, by the edge of a lake in a ferny area". Ray Manskie (1972) exhibited the species at the General Meeting of the Entomological Society of Victoria on 18 June 1972, reportedly "collected in the Cann River area 28.12.71 - 8.1.72", and it was noted that "This was a new locality" for the species. But his specimens (seen by K.L. Dunn and now in the Museum of Comparative Zoology, Harvard University) were actually collected at Gipsy Point and Mallacoota on 31 December 1971, i.e. on Mallacoota Inlet, not near Cann River. Crosby (1975) recorded *H. mirifica* from Mallacoota National Park, and stated (p. 124) that it was "Rare and Local", as is indeed the current understanding. It is resident in suitable habitat very close to the township of Mallacoota, having been recently observed near the foreshore caravan park by Geoff Walker and photographed close by at Develings Inlet by the second author (Dunn and Dunn database). A female has also been recorded at Gipsy Point by the second author and D.F. Crosby (Dunn and Dunn database). The Wingan Inlet record is the most westerly and southerly in Victoria.

An *Ogyris* species was recognised flying in the forest canopy at the rapids. Members of this group require close examination to identify the species involved. The usual method is to rear juvenile stages, or use a sweep net with a long extension pole to gain the required height to capture adults patrolling in the forest canopy. Adults infrequently occur low enough down to make a reliable visual identification, except when inspecting mistletoes for egg laying, locating mates at the site of emergence, or visiting mistletoe flowers for sustenance (Dunn & Kitching 1994, K.L. Dunn personal obs.). Populations are usually localised in areas where suitable host plants occur. The habitat and behaviour of the adults can give valuable clues as to the identity of species resident in an area. In this coastal region there are two candidates, given the well documented distributions of the species in Victoria (Dunn and Dunn 1991, Braby 2000) and the observed characters of the adult. The two potential species, *O. olane* (Hewitson) and *O. abrota* (Westwood), are both known from Genoa Peak (records in Dunn & Dunn database), in another area of the same National Park. Three species of mistletoe (which belong to a semi-parasitic plant lineage on which the larvae of this group of butterflies feed) are known from the vicinity of the study area. Each of these (viz. *Muellerina eucalyptoides*, *M. celastroides* and *Dendrophthoe vitellina*) is a recorded host of *O. abrota* (Braby 2000), but none is linked to *O. olane* (the hosts of which are also well known). Inferentially then, the adult was likely to

have been a male *O. abrota* on the balance of the circumstantial evidence available.

Unbeknown to the first author at the time of his visit, *Theclinesthes sulpitius* was first recorded and collected from Victoria "near the mouth of the Wingan Inlet" in February 1946 by A.N. Burns (Burns 1948 p. 105). The second author deliberately searched for it in the marsh area south of the jetty on 29 January 2008, without success. Rediscovery of it at Wingan Inlet after a lapse of nearly 66 years is welcome.

Yen (1985) provided a list of 75 species of butterfly from East Gippsland (east of the Snowy River) derived wholly from available literature. Several additional species have subsequently been recorded, and the region as a whole encompasses a much wider diversity of habitats than exist in the Wingan Inlet area. The 21 taxa recorded here represent 28% of the regional tally of Yen (1985), and probably a little more than 20% of the regional fauna as currently known. However, the fauna of the Wingan Inlet area remains poorly studied in comparison with Mallacoota Inlet and Genoa Peak, where considerably more survey work has been undertaken (Dunn and Dunn database). The records available have been obtained almost entirely in summer. Enthusiasts planning to visit should perhaps therefore opt for a spring or early autumn excursion to expand upon current knowledge.

Acknowledgements
The first author thanks Albert Aranha and Jill Koppel for enabling his trip to Wingan Inlet and for their company during explorations there. The second author thanks Linda Rogan for her regular contributions (ca. 1000 records) to the Dunn & Dunn database, with relevant ones cited in this report.

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Table 1. Butterflies recorded in the Wingan Inlet area, January 2012 by I.G. Faithfull. Coordinates approximate, obtained retrospectively from Google Earth (2012).

Species	Locality	Lat./long.	Date
Trapezites symmomus Hübn.	Elusive Lake track, 0.5 km E of Lake	37° 44.4′ 149° 27.6′	8/1
Signeta flammeata (Butler)	camping ground	37° 44.4′ 149° 29.8′	12/1
	Boundary Track, 1.6 km ENE of W.Wingan Rd	37° 41.7′ 149° 29.0′	13/1
Delias sp.	Wingan River rapids	37° 42.47′ 149° 29.67′	13/1
Delias harpalyce (Donovan)	c 450 m N of jetty	37° 44.2′ 149° 29.79′	12/1
	camping ground	37° 44.4′ 149° 29.8′	13/1
Delias nigrina (Fabricius)	20 m W of jetty	37° 44.43′ 149° 29.89′	11/1
Pieris rapae (L.)	Elusive Lake track, c 1 & 1.5 km SW of W. Wingan Rd	37° 44. 3′ 149° 27.8′ 37° 44.5′ 149° 27.5′	8/1
	Elusive Lake, NE shore	37° 44.6′ 149° 27.6′	8/1
	Wingan River at gauging station	37° 41.4′ 149° 29.5′	8/1
	10 & 70 m N, 300 m S of jetty	37° 44.43′ 149° 29.93′ 37° 44.41′ 149° 29.92′ 37° 44.69′ 149° 29.89′	8/1
	c 800 m S of camping ground	37° 44.8′ 149° 29.8′	9/1
	Rame Head trig point	37° 45.94′ 149° 29.57′	9/1
	Fly Cove	37° 45.1′ 149° 29.9′	12/1
	Wingan River rapids	37° 42.47′ 149° 29.67′	13/1
Heteronympha mirifica (Butler)	Rapids walking track, c. 1 km E of Boundary Track	37° 42.28′ 149° 29.15′	13/1
Heteronympha merope (Fab.)	Boundary Track, 1 km E of W. Wingan Rd	37° 42.0′ 149° 28.54′	8/1
	camping ground	37° 44.4′ 149° 29.8′	10/1
	0.5 km S of camping ground	37° 44.7′ 149° 29.8′	10/1
	Boundary Road at start of Rapids walking track	37° 42.28′ 149° 29.15′	13/1
Tisiphone abeona (Donovan)	Elusive Lake trk, c. 0.4 km SW of W. Wingan Rd	37° 44.0′ 149° 27.85′	8/1
	c 400 m S of camping ground	37° 44.6′ 149° 29.8′	9/1
	Boundary Track, 1.6 km ENE of W. Wingan Rd	37° 41.7′ 149° 29.0′	13/1
Vanessa kershawi (McCoy)	Rapids walking track, 0.4 km E of Boundary Track	37° 42.1′ 149° 28.9′	13/1
Danaus plexippus (L.)	Fly Cove	37° 45.3′ 149° 29.77′	9/1
Paralucia aurifera (Blanch.)	Wingan River rapids	37° 42.47′ 149° 29.67′	13/1
Ogyris sp.	Wingan River rapids	37° 42.47′ 149° 29.67′	13/1
Candalides hyacinthina (Semper)	Boundary Track 1.6 km ENE of W. Wingan Rd	37° 41.7′ 149° 29.0′	13/1
Theclinesthes sulpitius (Miskin)	10-300 m S of jetty	37° 44.45′ 149° 29.94′ 37° 44.69′ 149° 29.89′	8/1

Table 2. Additional records of butterfly species at Wingan Inlet. Data from Dunn and Dunn database unless otherwise specified.

Species	Date	Observer	Notes	Reference
Trapezites praxedes (Plötz)	28 Feb. 1946	A.N. Burns	recorded as "Wingan"	-
Trapezites symmomus Hübner	29 Jan. 2008	K.L. Dunn	1 female in open forest; inspecting a small species or small plant of *Lomandra*	-
	6 Feb. 2012	L. Rogan	Elusive Lake	-
Toxidia andersoni (Kirby)	23 & 26 Feb. 1946	A.N. Burns	recorded as "Wingan at 2 miles" (presumably NW along the road)	-
Signeta flammeata (Butler)	6 Feb. 2012	L. Rogan	Elusive Lake	-
Hesperilla picta (Leach)	23 Feb. 1946	A.N. Burns	"found freely near Wingan Inlet"; specimen in the Museum of Victoria labelled "Wingan at 2 miles" with date.	Burns (1948 p. 108) gave no exact locality or date
	21-23 Mar. 2010	L. Rogan	photographed (almost certainly this sp (id. K.L. Dunn)	-
Papilio aegeus Donovan	29 Jan. 2008	K.L. Dunn	old female, flying W	Dunn (2008)
Delias harpalyce (Donovan)	28 Feb. 1946	A. N. Burns	-	-
	28 Jan. 1984	D.E.A. Morton	-	-
Pieris rapae (L.)	4 Feb. 2012	L. Rogan	37° 44.8', 149° 30.2', "many on weedy Brassica along beach"	-
Geitoneura acantha (Donovan)	29 Jan. 2008	K.L. Dunn	id: "almost certainly"	-
Heteronympha banksii (Leach)	5 Apr. 1991	D.F. Crosby	-	-
	21-23 Mar. 2010	L. Rogan	-	-
Heteronympha merope (Fabricius)	21-23 Mar. 2010	L. Rogan	-	-
	6 Feb. 2012	L. Rogan	Elusive Lake; female	
Tisiphone abeona (Donovan)	28 Jan. 1984	D.E.A. Morton	-	-
	5 Apr. 1991	D.F. Crosby	-	-
	29 Jan. 2008	K.L. Dunn	1, basking in paperbark sedgeland	-
	21-23 Mar 2010	L. Rogan	-	-
	4 Feb. 2012	L. Rogan	Rame Head track at 37° 44.8', 149° 30.2'	-
	6 Feb. 2012	L. Rogan	Elusive Lake	-
Candalides hyacinthina (Semper)	6 Feb. 2012	L. Rogan	Elusive Lake	-
Theclinesthes sulpitius (Miskin)	25 Feb. 1946	A.N. Burns	collected (Museum of Victoria)	Burns (1948): gave only "February 1946"
Zizina labradus (Godart)	6 Feb. 2012	L. Rogan	Elusive Lake	-

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ECOLOGY

Michelle R Baker, Roger L Kitching, Chris A M Reid & Fran Sheldon: **Coleoptera (Chrysomelidae, Coccinellidae, Curculionoidea) in sclerophyll woodland: variation in assemblages among host plants, and host specificity of phytophagous and predatory beetles**

Nicholas M Fountain-Jones, Peter B McQuillan & Simon Grove: **Beetle communities associated with the tree fern *Dicksonia antarctica* Labill. in Tasmania**

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Lars Krogmann & Andrew D Austin: **Systematics of Australian *Agenioideus* Ashmead (Hymenoptera: Pompilidae) with the first record of a spider wasp parasitizing *Latrodectus hasselti* Thorell (redback spider)**

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Harry A C Fay: **A highly effective and selective male lure for *Bactrocera jarvisi* (Tryon) (Diptera: Tephritidae)**

Garry W Levot & Doug Somerville: **Efficacy and safety of the insecticidal small hive beetle refuge trap APITHOR™ in bee hives**

Suzanne Harper & Paul A Horne: **The feeding effects of western flower thrips (*Frankliniella occidentalis* (Pergande)) and wind damage on French beans (*Phaseolus vulgaris* L.)**

Anna A Rathé, Leigh J Pilkington, Geoff M Gurr, Mark S Hoddle, Matthew P Daugherty, Fiona E Constable, Joanne E Luck, Kevin S Powell, Murray J Fletcher & Owain R Edwards: **Incursion preparedness: anticipating the arrival of an economically important plant pathogen *Xylella fastidiosa* Wells (Proteobacteria: Xanthomonadaceae) and the insect vector *Homalodisca vitripennis* (Germar) (Hemiptera: Cicadellidae)**

Future meetings

A number of people have been informally meeting up at Michelinos Trattoria Restaurant prior to general meetings. Any members who would like to meet informally at Michelinos – at around 18:00 – are welcome to join us for a pre meeting chat / food. www.michelinos.com.au/ 69 Pelham Street Carlton VIC 3053 (03) 9663 336

2012 meeting dates: Council meeting: November 20th

Month	*Date*	*Planned event*	*Topic*
October	16th	General meeting	Members' presentations
December	TBC	Excursion/ BBQ	Date TBC Excursion co-hosted with Riddells Creek Landcare Group. Details available soon.

2013 meeting dates: Council meetings: March 19, May 21st, July 16th, Sept 17th, Nov 19th

Month	*Date*	*Planned event*	*Topic*
February	19th	General Meeting	TBC
April	16th	AGM	Speaker TBC
June	18th	General Meeting	Members' short presentations
August	20th	Members' excursion	TBC
October	15th	General Meeting	Members' short presentations
December	12th	Excursion	TBC

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Contributions may *preferably* be E-mailed to Internet address: editor@entsocvic.org.au. or posted to the Hon. editor in ***Microsoft Word for Windows*** with an enclosed hard copy. Tables should fit an A5 page with 1 cm borders as a maximum size. The main text of the news bulletin is prepared in 8 point, *Book Antiqua* font (please do not use fixed point paragraph spacing). The deadline for each issue is the third Friday of each odd month.

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Tuesday November 20th

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Scientific names contained in this document are *not* intended for permanent scientific record, and are not published for the purposes of nomenclature within the meaning of the *International Code of Zoological Nomenclature*, Article 8(b). Contributions may be refereed, and authors alone are responsible for the views expressed.

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